given. In our work at the Los Angeles General Hospital with the eclamptic toxemias, we have used as much as 22 grams, intravenously, in twelve hours without any evident ill effects. Assuming that not more than three or four doses of two cubic centimeters of 50 per cent solution, intramuscularly, would be necessary in any case, I believe that one would be well within the limits of safety and need not fear any ill effects.

For the second stage, I personally prefer nitrous oxid analgesia. In our endeavors to obtain a good analgesia, we must not overlook the fact that a most important factor in securing a "painless labor," is the early recognition and correction of any malpositions or malpresentations; for we must not allow too long a second stage in the hope of having such abnormalities spontaneously corrected.

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LYMAN H. ROBISON, M. D. (222 Westlake Professional Building, Los Angeles).—Obstetrical analgesia is a subject receiving considerable attention and discussion, not only by obstetricians, but by the laity as well, and more and more are women demanding a "painless childbirth" from their physicians. As a result the obstetrician frequently has a difficult course to pursue in attempting to accede to the patient's requests and yet keep clear of the dangers and complications of the several methods of analgesia now in use. On the other hand, the woman in labor is entirely right in expecting an effort at the relief of pain and, with our present knowledge of analgesia, we are not giving her the protection to which she is entitled if some pain-relieving procedure is not employed.

With Doctor Fist, I feel that morphin in labor is not free from danger to the child and that it should never be used late in labor. Even when used early and followed by an inhalation anesthesia, one not infrequently finds some difficulty in resuscitating the infant. If the morphin could be replaced with some efficient preparation free from the untoward effects of the narcotic, it would add materially to the safety of an analgesic method in obstetrics.

The suggestion made by Doctor Fist of combining scopolamin and magnesium sulphate interests me. It appears to be a simple procedure and, while I have had no personal experience with the method, the combination should enable one to obtain good results. The only drawback that I see to the method is the rather uncertain action of the scopolamin when used alone, not infrequently acting as a cerebral excitant rather than a hypnotic. If, as Doctor Fist claims, the presence of the magnesium sulphate prevents this untoward action, it appears to me to be a procedure well worth while in inducing analgesia during labor.

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DOCTOR FIST (Closing).—The interest in obstetrical analgesia, as evidenced by the discussions of Doctors Bland, Lazard, and Robison, indicates the attitude of present-day obstetricians. Relief of pain during childbirth is no longer considered unnecessary. The method under discussion is presented because of its simplicity, safety and effectiveness.

Elimination of the use of morphin seems highly desirable. Magnesium sulphate and scopolamin in the dosage employed have proved to be well within the safety limits. The average patient will not require, at the outside, more than three doses of scopolamin grain 1/200, nor more than five doses of magnesium sulphate, two cubic centimeters, of a 50 per cent solution.

Van Hoosen administers scopolamin, grain 1/100, every half hour as needed, without any ill effects. Lazard gives as much as 22 grams of magnesium sulphate, intravenously, in twelve hours. Lee Dorsett (*American Journal of Obstetrics,* February 1926, p. 227) gives as much as 100 cubic centimeters of magnesium sulphate, 25 per cent solution, intramuscularly, in twenty hours. Our average dosage is 4 to 5 grams, intramuscularly, during the course of the labor. Care must be taken to inject the magnesium sulphate deeply into the muscles to avoid abscess and slough.

CHILDHOOD TUBERCULOSIS—ITS TREATMENT*

REPORT OF CASES

By CHARLES L. IANNÈ, M. D.
San Jose

DISCUSSION *by Charles P. Durney, M.D., San Jose; Chesley Bush, M. D., Livermore; Ann Martin, M. D., Oakland.*

THE problems met in treating a chronic disease such as tuberculosis in childhood are of two distinct natures. They are problems of the mind and of the body. The aim of the physician of a child so afflicted must be to produce a mentally and physically well adult.

PLACE OF PARENTS IN TREATMENT

As the treatment of disease begins with the diagnosis, and as the child can only be treated through a third person—the parent—the manner in which the diagnosis is received will have a direct bearing upon the course of the disease, and the future welfare of the child. J. A. Meyers,[1] in a recent paper, states that there are three main types of reactors: the first, the mother who feels the diagnosis is impossible, as tuberculosis has not been in the family before; the second, who becomes hysterical, as she considers all forms of tuberculosis fatal; and the third, who is relieved to know that at last a diagnosis has been arrived at and that with the proper institution of treatment, good opportunity for recovery is assured.

A good type of the hysterical mother consulted me concerning her child of ten years. The history showed that the child had been subject to frequent colds and headaches. He recently had had scarlet fever with a complicating nephritis. A tonsillectomy had been performed because of continuation of fever. A change of doctors then occurred, as the child did not improve immediately. The second physician on finding "moisture" in the chest ordered an x-ray. On the subsequent visit the diagnosis of hilum gland tuberculosis was given the parent, together with indefinite unwritten instructions to give the child rest, plenty of food, fresh air, and sun baths. I gathered that she believed her child to be threatened by death. She placed him on twenty-four hours bed rest regimen without lavatory privileges; put him on a high caloric diet; began a rigorous course of sun baths with the initial dose of fifteen minutes to complete body; and took frequent temperature readings.

On examination the child was found to weigh one hundred pounds, thirty-two pounds over the average for age and height; lungs and heart were negative; purulent secretion was present in the nasopharynx.

The x-ray was consistent but not conclusive of hilum gland tuberculosis.

The mother was assured that the child did not have a fatal form of tuberculosis and that the rigid regimen should be modified. She was told

* Read before the Pediatric Section of the California Medical Association at the fifty-eighth annual session, Coronado, May 6-9, 1929.

her morbid fear and anxiety was detrimental to her child, who was precocious and delighted in helping in the recitation of his symptoms. A recent letter from the mother states that she is following my advice and that both the child and herself were much happier.

I felt that in this case the doctor was at fault in the manner in which the diagnosis was presented. A written program of the prescribed hours of rest, sun baths and nourishment should have been given, as one would do in prescribing drugs. At the same time it should have been explained that many conditions have the same group of symptoms and that only a tentative diagnosis could be arrived at for the present.

We do not doubt that the finding of calcified glands in the hilum may have indicated the presence of a tuberculous infection, but the disease from which the child was suffering was apparently a chronic nasal infection with recent bronchitis. At Del Valle Preventorium, at which institution I was on the staff for four years, Bush found that from 10 to 25 per cent of contacts who were admitted had other foci of infection besides their tuberculosis to account for their present symptoms.

From a purely medical viewpoint the problems are as varied as are the manifestations of tuberculosis. The infantile and adult form of pulmonary disease, the lymphatic and bone manifestations, each present problems entirely alien to the other. They are similar only in that rest and hygienic measures are common in the treatment of all types.

The treatment of the infantile and the adult types of pulmonary disease, because of their gravity at this age, have to my mind only one correct method of treatment, that is, the removal of the child to a hospital or sanatorium where the strictest regimen can be pursued. The lesions at this time are of the preponderately exudative form, and are usually bilateral and progressive. Armand DeLille [2] has treated many children by induction of artificial pneumothorax, but a report of his results is inconclusive, for his cases were apparently still under treatment. He feels that because of the high mortality, that this type of interference is indicated. At best, interference is palliative in the majority so afflicted.

TUBERCULOSIS OF BONES AND JOINTS

The next form of tuberculosis to be considered is that affecting the bones and joints. Since Rollier startled the medical and lay world by his conservative nonsurgical method of combined sun exposures and fixation apparatus, physiotherapists have tried his methods with indifferent results. A few men, such as Gauvain of England and Lo Grasso and Hyde of the United States, have reported good results from these methods. The majority have called in orthopedists, who tempered the medical treatment with conservative surgical procedures. In the place of bone curettements, extra-articular fixation bone graft operations with correction of deformities are now resorted to. By the fixation of the joint the additional local rest to the part is insured, and healing takes place more rapidly, safely, and securely. The danger in surgical treatment is the false security that may result from the immediate operative results, for we must not lose sight of the fact that the local disease is only one manifestation of a general disease, and that rest and other measures are necessary for several months until all symptoms of activity have subsided.

TUBERCULOSIS OF LYMPH GLANDS

Perhaps the most difficult form of tuberculosis to treat and the type that gives the practitioner more worry because of its indefinite diagnosis and symptomatology, is tuberculosis of the lymph glandular system. The problems are many. It is a fairly simple procedure to treat a sick child during the course of an acute illness; but to treat an apparently well child who has a basic chronic infection will tax the ingenuity of the physician and the patience of the parent.

Because of the chronicity of the disease, and need for institutional treatment during the formative years of childhood, inferiority complexes may be set up that will hamper future initiative.

Before going into the procedure used in treating this form of the disease, two cases, illustrating the inefficacy of treating tuberculous glands by local measures only, will be presented.

REPORT OF CASES

Case 1.—A husky boy of ten came under my observation. The only appearance of general toxemia was a slight pallor, dark circles under the eyes, and an irregular low-grade fever. He had been treated at a San Francisco hospital for enlarged cervical glands during the preceding year. First a tonsillectomy, followed by a course of x-ray treatment; then an attempt at a radical bilateral gland dissection was done. His neck and face were frightfully scarred by large keloids that continued to suppurate. A few weeks preceding admission to the sanatorium the posterior cervical glands began to enlarge and one abscess was incised. Investigation showed that no attempt at rest regimen had been advised or attempted. After a few months of sanatorium rest the enlarged glands subsided, the suppuration of scars ceased and the general condition was markedly improved.

Case 2.—Another child had had a lupus of the dorsum of the foot of six years' standing and multiple sinuses of the neck following bilateral dissection. Upon being placed on a strict rest regimen with removal of dressings, thus exposing the neck to the air and sunlight, the wounds showed immediate improvement. A complete healing of lesion of the foot occurred in a few months.

COMMENT

The proper care for this type of child in the home consists in finding the causes for the substandard condition and eliminating them. Inadequate diet, focal infection, systemic diseases, and insufficient rest are found to be the chief factors that undermine the resistance against tuberculosis.

Inadequate diet may be due to poor budgeting or ignorance of dietary principles. Through education of parents, as is being done at the Oakland Health Center, with the coöperation of the adult educational department,[3] this problem becomes a

simpler procedure. The elimination of focal infections is taken care of through frequent surveys in both the preschool and school clinics. Systemic diseases are being made less dangerous through conferring of artificial immunity, as for diphtheria, smallpox, and scarlet fever. The most difficult factor to apply in the home treatment is *rest.*

As a preliminary to the application of rest in the home, a careful survey of the child's daily activities is necessary.

CASE 3.—A case illustrating this point is that of a 16-year old high school girl exposed to a tuberculous mother since birth. One year previous, because of the presence of fever notwithstanding a negatively read x-ray plate, the child was put on a short rest period which was taken rather indifferently. A careful history of her daily activities elicited the following:

She arose at 6 a. m. to study for one hour before breakfast. Breakfast at 7 a. m.; 7:15 to 8 more study; in school from 8 to 12 noon. Then followed a sandwich lunch without milk or hot soup, accompanied by further study. In the afternoon, gymnasium and school until 3:30 o'clock; home at 4 o'clock; studied organ lessons until 5:30 o'clock. Supper, and then more study from 7:30 to 9:30 p. m. or until she fell asleep over her books.

The above would be a big day for an adult, let alone a girl in whom the following symptoms were noted: nineteen pounds underweight; lymphatic gland enlargement, necessitating removal of one gland in the previous year; cessation of menses; repeated colds and fever 99.2 to 99.4 F. She cried frequently and was emotionally upset, as her school work was not so good as formerly.

The physical examination revealed a few fine inconstant râles at right apex; second x-ray showed a calcified primary focus under right clavicle. In retrospect, the first x-ray showed a slight haze in this area.

The following changes were made in her schedule:

The child was to rise at 7 a. m. instead of at 6 a. m., eliminating morning studies. One subject and gymnasium were dropped, and a two-hour rest period was substituted at school. Study after supper, and to bed at 8 p. m. After one month her menses returned, she began to put on weight, nervousness and hyperemotionalism disappeared.

REST AND OTHER REGIMEN

As was stated before, the application of rest in the home is not an easy matter. Explicit orders should be given as to the time, amount and place where the child should be put to rest. One must stipulate that the child be clothed as for bed, because psychologically he will respond to sleep more readily. It is difficult to get the child's cooperation, as rest is uninteresting for the active mind, and he cannot see the why of rest when all persons about him are active.

If rest at home is impossible, it may be given as a "rest gym" at school. Those children who do not respond to this modified home-school rest program should be referred to a preventorium.

In the preventorium, children are protected from repeated systemic diseases by a two weeks' isolation of the new child, and prohibition of child visitors. Rest is easily applied, as he is admitted into a group that is already disciplined. He soon finds that he must eat the foods that he refused at home. His play and school hours are allotted as he is able to tolerate them. He is also given short sun and air baths as a tonic to metabolism. The child is soon transformed into a picture of health, rarely seen in an ordinary school group.

But this is only a start on the road to health. As Trimble [4] puts it, "the parent is liable to think that an institution is a place to get perfectly well and leave all troubles behind." This is far from the truth. The factors at home which originally produced the subnormal condition will, in a short time, undo all the good done by the stay at the preventorium.

SOME PREVENTORIUM OBSERVATIONS

In a preliminary report by the author [5] of a survey made by the Oakland Health Center of one hundred children who had been discharged from Del Valle Preventorium, about 40 per cent were found to be underweight. A later and more complete report by Bush and Shepard,[6] showed the following: Of 120 discharged Oakland children 107 were accounted for, and of this group, fifty-eight were underweight; only fourteen of this number having been discharged below normal weight. In the Berkeley group of forty patients, nine were readmitted to the preventorium, ten were awaiting readmission, seventeen failed to improve, and four showed steady improvement. This is certainly a discouraging situation.

Several factors account for the inability of this type of child to get the additional rest that is necessary to keep him fit. Parental ignorance with lack of understanding of what constitutes proper health, thus failing to see the need for the application of the efforts required, accounts for some failures. Secondly, there is poverty, requiring that both parents be at work, putting the responsibility of taking the rest period on the child himself. Thirdly, there is a group who try to apply the rest ordered, but because of the difficulty of getting the child's coöperation, finally give up in despair.

To readmit these children in a preventorium is only wasted effort, for on discharge the same picture is enacted. This may be done repeatedly until the child has passed puberty, but the discipline of an institution may insure a healthy body at the expense of a proper mental outlook on life. The gap between the sheltered life of a preventorium and home seems too great.

HOW THE SCHOOL MAY AID

The home having failed, the school may then be called upon. Group discipline and established organization make it possible for the school in this way to give to the child what is his inherent right, the right to grow in mental and physical development. This may sound a bit paternalistic, but so is the public school. The school helps to regulate physical health through its gymnasium, calling it physical education. Rest, its counterpart, is just as much a part of physical education and, in all primary grades, should be a regular feature of the daily curriculum, following the noonday recess.

Until this utopian condition becomes a fact, the under par child at least should be taken care of

through the open window school,[7] as is done in Chicago, where in twenty-six schools there are fifty-six such rooms caring for 1680 children. In a recent report they find that of 1963 open window room children compared to a like number of the normal group, the open window group gained 3.6 pounds, as against 2.5 pounds of the latter.

To overcome the defect in the follow-up work in Berkeley, Shepard suggested that a centralized preventorium school be organized to take care of the ex-preventorium and other substandard children. The school program was modified to allow supervised play, rest periods, sun and air baths, and hot luncheon under direction of the school dietitian. Of seventy-nine children cared for, 73 per cent were benefited. Improvement of the ex-preventorium children was especially noted. A marked reduction in the waiting list of children for the preventorium occurred. Better grades resulted and a reduction in the percentage of absences from 18.7 to 9.2 per cent resulted.[6] Centralized preventorium schools of this type serve as centers for disseminating health education to the teachers and parents in the community.

Hayward has a nutrition class of this type; Oakland has recently started a preventorium school in the better and poorer sections. Once established, the need for more of this type of school is soon recognized.

SUMMARY

In conclusion, we wish to emphasize that *rest* and *time* are the chief factors in the cure and prevention of childhood tuberculosis. That the home and school are the places where these principles must be put into effect. That the preventorium should be resorted to only when these measures fail.

Sunnyholme Preventorium, Santa Clara County Hospital.

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DISCUSSION

CHARLES P. DURNEY, M. D. (San Jose).—I take it that Doctor Iannè, in treating this subject, stresses particularly the conduct of that type of case falling in the group which has brought about so much discussion and dissension mainly from the standpoint of diagnosis—the pretuberculous child, or the tuberculosis suspect, or, as it is sometimes termed, the contact.

We all recognize the type, that "under par" child in which there are suggestive signs but in which so frequently we find a doubt as to the actual presence of active tuberculous lesions.

There is no question regarding the indicated regimen for a child definitely ill with clinically manifested tuberculosis in any of its forms. This type of case is primarily and emphatically an institutional charge and should be under the care of those who are trained and experienced in order that every phase of the child's condition may be under observation and study and every advantage offered to forward what usually are but the slimest of chances in this serious affliction.

Too much stress cannot be given two most important elements in this subject—*rest* and *time*. When we say of faith, hope, and charity that the greatest of these is charity, we can say of that triology—so much a part of the treatment of tuberculosis—fresh air, good food, and rest, that the greatest of these is *rest*. We should also add that *time* is a very marked essential. There are no short cuts to a cure.

I believe that we have, however, one of the most splendid examples of what can be done for these youngsters that we have in any department of medicine. It answers every question and needs only the same faithful application in a general way but on a greater scale, and it is demonstrated every day in our preventorium. If the National Tuberculosis Association has done nothing else, it has created something of which to be justly proud in the preventoria which have grown out of the idea conceived, nourished and materialized under its study and guidance. If any physician desires to know what is best to do for the type of child we are considering, let him visit a modern and up-to-date preventorium and receive its inspiration, and borrow its book of rules.

Regarding the under par school child, we are certainly coming to the fresh air school. And it is of interest to note the awarding of certain credits to students who are placed on rest periods. Our local junior colleges and the University of California are doing this. When they all fall in line, much good will follow, as a youngster will have an incentive which appeals. To gain a credit by lying down and relaxing for an hour will not be so much like punishment. Verily, this thing we have preached for so long a time, *rest,* is being accepted.

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CHESLEY BUSH, M. D. (Arroyo Sanatorium, Livermore).—A large amount of work has been done in the past ten years by tuberculosis associations and others in "preventive" work among children. This work has been handicapped by lack of knowledge and difficulty of interpretation as to just what constitutes tuberculosis in a child. While the broad principles of prevention and care have undoubtedly been right, it is also true that a great deal of money and effort has been expended on groups of children who are economic and social problems rather than medical problems. Children have largely been chosen for treatment from the underweight groups. The careful studies of Opie and McPhedran and their associates have pointed out to us most forcibly that tubercle infection, and even the tubercle lesion, need not be in the underweight group; and therefore a revision in the plans of selection of children for preventorium and school care is about to take place.

We have had an interesting opportunity to study the development and regression of tuberculous lesions in the lungs of children from infancy up to adolescence. We have been impressed with the value of time in the treatment of juvenile tuberculosis just as in adult tuberculosis. Where juvenile infection exists reduction of physical strain on a child must be carried out for a period of years. It is obviously impossible to do this in a preventorium, it is possible but generally difficult and impractical to find parents who will carry on a protracted regimen at home in an apparently healthy child, and hence the problem falls back upon the school. A course of extra rest and nutrition becomes a part of the school schedule easily. And so we have ended just where we started—in the school. Tuberculosis prevention is a school problem because

selection and treatment can be carried on in the school except in a small percentage of cases where preventorium or sanatorium care will always be necessary to check a progressing lesion.

In the next decade a large part of the work we have been doing with children in clinics and preventoria will be accepted and carried on by school departments, just as routinely as the teaching of arithmetic. For this the present-day preventoria have pointed the way.

We have had an opportunity to observe a number of children who have been hospitalized for years because of extensive tuberculous lesions, and who have eventually recovered. The wreckage of their bodies was nothing compared to the wreckage of their minds, their character, and their entire viewpoint on life. For that reason I believe that the institutionalization of children should be avoided as a policy and every effort made to make a stay in an institution as short as possible. It is as important that a child be brought up in a normal environment as it is that he has a normal body. Our present-day preventoria are operated with this point in view, and furnish better homes for the children than those from which they come in most instances; but the health education gained there does not carry back into the homes with the younger group of children who quickly forget.

Children with extensive pulmonary lesions of the juvenile type do get well; it has been astonishing to us. But in order to achieve that end we need all our facilities—sanatorium, preventorium, and school care, in the order named. We must use all our facilities to the best advantage. With a better selection of children, a more extensive use of our schools in treatment, and a better selected group in our preventoria and sanatoria, we should be handling our problem with great efficiency.

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ANN MARTIN, M. D. (Baby Hospital, Oakland).—Time and rest are the two most important factors in the treatment of the child infected with tuberculosis. Whether this care should be given in a sanatorium, preventorium, the home, or the school, depends on the extent and character of the lesion found in the lungs, and upon the age of the child. There is no difference of opinion that sanatorium care is desirable for the acutely ill child, though here, after a time, the child will do better, both mentally and physically, and progress faster if removed from the sanatorium for home or school care.

In a series of fifty children with pulmonary infiltrations, seen by me at the Baby Hospital contact clinic, thirty-five were under six years of age when first seen. This high proportion of pulmonary infiltrations (which are potentially the most serious lesions) in the preschool child means that home, and not school care, must supplement sanatorium treatment.

Our problem here is to work out a satisfactory routine which the busy mother can carry out at home. In my experience this can be done successfully in most cases if detailed supervision is maintained over a fairly long time by the doctor and visiting nurse. Most mothers are unwilling to send their young children to an institution unless the effort to care for them at home has failed to give results. Home care requires, first, coöperative parents; second, a continuous sympathetic supervision of the child by the doctor. Explicit directions as to rest, activity, and diet are essential. Periodic visits to the doctor and home visits by the visiting nurse, inspire the mother with a feeling of confidence, helpfulness, and hopefulness, and gives her the incentive to maintain the prescribed routine through the many months necessary to secure a cure in the child.

Frequent x-ray pictures must be taken, as only through serial pictures can we follow the progress of the lesion; these findings are a definite guide in treatment. The frequent taking of x-ray pictures also gives the parents a feeling of confidence and again definitely helps them to maintain the routine.

I feel a word of warning should be sounded here against the too frequent acceptance of weight as the sole measure of a child's physical fitness and health. Lack of fatigability and irritability, improvement in the child's school progress, are valuable criteria of the child's progress in his return to normal health.

Another point probably of first importance in the treatment of the tuberculous child is to break his contact with the source of his infection. The extent of the disease and the prognosis depend upon avoiding repeated inoculations with the tubercle bacilli. In the words of McPhedran, "Experience suggests that the determining factor (in the cure of tuberculosis) even after consolidation is extensive, is complete termination of exposure to the infecting source."

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DOCTOR IANNÈ (Closing).—As Doctor Durney presumed, I particularly wish to stress in this paper the problem of diagnosis and care of the substandard or pretuberculous child. The stigma which formerly rested on rest as a part of health education is being broken down, as witness the giving of credits for rest by high schools and colleges.

I realize that weight is not the sole or major criterion for selection of the substandard child. It is nevertheless a good index by which to select and study the greater portion of substandard cases. Then with finer details as to history, observation and special examinations, such as the tuberculin test and chest x-ray graphs, only a few children will be overlooked.

Doctor Bush mentions the impracticability of finding parents who will carry on a protracted rest regimen in children who are apparently well. This care, then, devolves upon the state through the school.

President Hoover, in calling the 1930 Conference on Child Welfare, sounded the correct chord when he stated: "It is not the purpose of such efforts to invade or relieve the responsibilities of parents, but to advance those activities in care and protection of children who are beyond the control of the individual parents."

HUMAN TORULA INFECTIONS—A REVIEW*

REPORT OF CASES

By HOWARD A. BALL, M. D.
Los Angeles

DISCUSSION *by Newton Evans, M. D., Los Angeles; Willard J. Stone, M. D., Pasadena.*

DEFINITION AND CLASSIFICATION

TORULA infections are those infections involving chiefly the central nervous system and lungs, caused by yeast-like organisms, belonging to the group of *Fungi imperfecti.* Prominent features have been transparent capsules, as seen in tissues and to a less degree in cultures, and in cultures reproduction primarily by budding. Striking clinical features are the absence of bone lesions and the extreme rarity of skin lesions, one case being reported in which one skin lesion occurred when the disease was disseminated. The classification given by Sheppe [1] is acceptable for the present.

Torula infection as a clinical entity is well established. The identity of the organisms in the cases reported is far from certain. A number of cases have been accepted without cultural data, the diagnosis having been based on the histological picture. The second of the cases here reported

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